

ABSTRACT

**MAGNETIC BIASING LAYER FOR GMR SENSOR OF A MAGNETIC HEAD
FOR A HARD DISK DRIVE**

A GMR sensor of a magnetic head for a hard disk drive including a free magnetic layer that is disposed between two hard bias layers that creates a bias magnetic field within the free magnetic layer. A bias reduction layer is disposed parallel to the free magnetic layer, and a spacer layer is disposed parallel to and between the free magnetic layer and the bias reduction layer. A negative magnetic coupling between the free magnetic layer and the bias reduction layer induces a bias reduction magnetic field in the free magnetic layer. The bias reduction field substantially counteracts the bias field in the central portion of the free magnetic layer, and the sensitivity of the free magnetic layer to small magnetic fields from the magnetic disk is significantly increased. A hard disk drive with decreased track width and increased areal density using this magnetic head is also disclosed.

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